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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/699,845	11/04/2003	Sung-Su Jung	8734.248.00 US	4037

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EXAMINER	
LIN, JAMES	

ART UNIT	PAPER NUMBER
1792	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/699,845	JUNG ET AL.	
	Examiner	Art Unit	
	Jimmy Lin	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 January 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9 and 11-13* is/are pending in the application.

4a) Of the above claim(s) *1-7* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *8,9 and 11-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/14/07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/22/2008 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 8-9 and 11-13 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

There is no support for "a third flow amount of gas corresponding to the dispensed amount of the dispensing material in the syringe" while "the third flow amount of gas corresponds to the divided parts of the second flow amount of the gas". The specification only teaches that dispensing can still be performed if a detected flow amount of gas is in the range between the first flow amount and a sum of the first and second flow amounts [0030], but does not teach how it relates to the third flow amount of gas.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 8-9 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto et al. (U.S. Publication No. 2001/0013920) in view of Applicant's admitted prior art (hereafter, AAPA) and Kawabe et al. (JP 64-059823, one of Applicant's cited references).

Hashimoto teaches a method of making a liquid crystal display (LCD) (abstract). A sealant can be formed on the substrate through a dispenser method [0046].

Hashimoto does not explicitly teach that the dispenser method for the sealant can be performed using a syringe. However, Hashimoto does teach that a liquid crystal composition can be injected onto a substrate through a nozzle of a syringe 42 [0050]. An air pressure source 44 supplies air into the syringe and a controller 43 controls the air pressure source to regulate the volume of the liquid crystal composition to be discharged ([0109]; Fig. 14). It would have been obvious to one of ordinary skill in the art at the time of invention to have dispensed the sealant using the syringe that dispenses the liquid crystal with a reasonable expectation of success because Hashimoto teaches that such a syringe is an operable dispenser for depositing onto an LCD substrate. The selection of something based on its known suitability for its intended use has been held to support a prima facie case of obviousness. Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945). Repeated dispensings of the sealant through the syringe by supplying intermediate flow amounts of gas to the syringe would be performed when the syringe is dispensing onto subsequent substrates. The transition to the subsequent substrates would necessarily require intermediate flow amounts of gas.

Hashimoto does not explicitly teach detecting a first flow amount of gas. However, AAPA teaches a need to detect the residual quantity of sealant that remains in a syringe when forming a seal pattern on a substrate. An operator detects an initial charge quantity of the sealant filled in the syringe and calculates a consumed quantity of sealant by calculating a length of the seal pattern during its formation to thereby estimate a residual quantity of the remaining sealant. If the syringe does not have enough sealant, the seal pattern will only be partially formed or not formed at all, causing a defective LCD panel and a decrease in productivity (paragraph [0015] of Applicant's specification). Kawabe teaches a method of accurately detecting the residual material 13 in a syringe 11. A pressure gauge is installed in the syringe to detect the pressure of

the head space. The residual amount can be detected by measuring the time required to reach a predetermined pressure when feeding gas into the syringe (abstract; Fig. 1). It would have been obvious to one of ordinary skill in the art at the time of invention to have used the residual-detecting technique of Kawabe in the process of forming a sealant of Hashimoto because AAPA teaches a need to detect the residual quantity in a syringe and because Kawabe teaches that such a residual-detecting method is operable for use in syringes. One would have been motivated to do so in order to accurately detect if the residual amount of sealant would form a complete seal pattern, thereby avoiding the manufacture of a defective LCD panel.

The method of determining the residual amount as taught by Kawabe is an indirect method of determining a first flow amount as claimed. The method of Kawabe feeds gas into the syringe until a predetermined pressure is reached within the syringe. This detection method determines the residual amount of paste in the syringe. Based on the residual amount, the space or volume not occupied by the paste can be calculated (i.e., residual volume of paste subtracted from the total volume of the syringe). Using the ideal gas law PV = nRT (P is pressure, V is volume, n is the amount or mols of gas, R is a constant, T is temperature), the flow amount of gas (i.e., the variable n) can be calculated because pressure, volume, and temperature are known. The volume corresponds to the space not occupied by the paste. The variable n corresponds to the claimed first flow amount.

Hashimoto does not explicitly teach determining a second flow amount of gas and detecting a third flow amount of gas. Hashimoto only teaches that a controller 43 controls the air pressure source 44 to regulate the volume to be discharged from the syringe [0109]. However, Hashimoto does recognize that the gas source must be controlled in order to dispense a desired amount of dispensing material. In other words, there is a correlation between the amount of gas supplied and the amount of material dispensed. Because the amount of gas supplied to the syringe is controlled, to have measured the actual flow amount of this regulated gas would have been an obvious modification. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have determined the flow amount of gas supplied to the syringe in the method of Hashimoto with a reasonable expectation of success because such a determination is merely a measurement of the amount of gas metered into the syringe.

Hashimoto does not explicitly teach determining a second flow amount of gas by supplying the gas to the syringe filled with the minimum quantity of residual dispensing material that is enough to ensure a previous dispensing but not enough for a subsequent dispensing and the second flow amount divided into predetermined parts. However, the second flow amount of gas can be calculated based on 1) the determination of the residual amount of material in the syringe (i.e., the method of Kawabe), 2) the correlation between the flow amount of gas supplied to the syringe and the amount of material dispensed (i.e., the correlation of Hashimoto), and 3) the amount of material required for each LCD substrate (i.e., an amount that can be calculated according to AAPA). AAPA teaches that it was well known to stop using the syringe when the residual quantity reaches a minimum quantity that will not form a proper seal [0014]-[0015]. The second flow amount can then be determined and can be divided into predetermined parts, wherein the predetermined parts correspond to the flow amount of gas required for deposition of the material on each substrate.

The third flow amount of gas can be determined merely from measuring the total flow amount of gas used during a period of dispensing, correlating to the total amount of material dispensed from the syringe. The residual amount in the syringe can be determined by using simple algebra (i.e., the second flow amount of gas minus the third flow amount of gas).

Therefore, the determination of the second flow amount of gas, the third flow amount of gas, and the residual amount in the syringe can be calculated using known variables and simple algebra. To have performed such calculations would have been an obvious modification to one of ordinary skill in the art at the time of invention.

Hashimoto, AAPA, and Kawabe do not explicitly teach wherein the dispensing material is still dispensed if the third flow amount of gas corresponds to the divided parts of the second flow amount of gas. In this case, the third flow amount of gas corresponding to the divided parts of the second flow amount of gas is being interpreted to be when the third flow amount of gas is less than the sum of the divided parts, meaning that the amount of residual dispensing material left in the syringe is capable of making at least another dispensing. If there was enough sealant for another substrate, it would have been an obvious to have continued dispensing until it was detected that the syringe had insufficient amount of sealant for an additional dispensing. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention

to have continued dispensing if the third flow amount of gas corresponds to the divided parts of the second flow amount of the gas.

Claim 9: Hashimoto, AAPA, and Kawabe do not explicitly teach wherein determining the residual quantity includes detecting the divided parts corresponding to the third flow amount of the gas. However, the determination of the number of divided parts that has been used or that remains in the syringe requires simple algebra, and thus, are obvious modifications to one of ordinary skill in the art at the time of invention.

Claim 11: The dispensing material can be a sealant, as discussed above.

Claim 12: Hashimoto teaches that liquid crystal can be dispensed from the syringe, as discussed above, but the combination of references do not explicitly suggest the use of the residual-determining method with liquid crystal. However, one of ordinary skill in the art would have recognized that an insufficient amount of liquid crystal dispensed on the substrate would have created a defective LCD panel. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have used the residual-detecting technique in the dispensing of liquid crystal. One would have been motivated to do so in order to have avoided the manufacture of a defective LCD panel.

6. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto '920 in view of AAPA and Kawabe '823 as applied to claim 8 above, and further in view of Hashimoto et al. (U.S. Publication No. 2003/0083203).

Hashimoto '920, AAPA, and Kawabe are discussed above, but do not explicitly teach that the dispensing material can be silver. However, Hashimoto '203 teaches that conductive fine particles, such as silver, can be dropped onto an LCD substrate from a nozzle [0102]-[0104], wherein the silver is dropped in the form of dots at the outer edges of the image display to prevent breaks and short circuits ([0191]-[0195]); Fig. 8). Hashimoto '920 teaches that materials can be deposited onto an LCD substrate by dropping the material through a nozzle of a syringe. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have connected the upper and lower substrates of Hashimoto '920 using the silver dots of Hashimoto '203 in order to have prevented breaks and short circuits. In addition, it would have been obvious to one of ordinary skill in the art at the time of invention to have dropped the silver

dots onto the LCD substrate using the syringe of Hashimoto '920 because Hashimoto '920 teaches that such syringes have nozzles that are suitable for dropping material onto LCD substrates. The selection of something based on its known suitability for its intended use has been held to support a prima facie case of obviousness. Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945).

The combination of references does not suggest using the residual-determining method in the process of dispensing silver. However, such a modification is obvious for substantially the same reasons as discussed for claim 12 above.

Response to Arguments

7. Applicant's arguments filed 8/17/2007 have been fully considered but they are not persuasive.

Applicant argues on pg. 5 that the cited references do not teach or suggest at least "wherein the dispensing material is dispensed if the third flow amount of gas corresponds to the divided parts of the second flow amount of gas". In this case, the third flow amount of gas corresponding to the divided parts of the second flow amount of gas is being interpreted to be when the third flow amount of gas is less than the sum of the divided parts, meaning that the amount of residual dispensing material left in the syringe is capable of making at least another dispensing. If there was enough sealant for another substrate, it would have been an obvious to have continued dispensing until it was detected that the syringe had insufficient amount of sealant for an additional dispensing. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have continued dispensing if the third flow amount of gas corresponds to the divided parts of the second flow amount of the gas.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jimmy Lin whose telephone number is (571)272-8902. The examiner can normally be reached on Monday thru Friday 8AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jimmy Lin/
Examiner, Art Unit 1792

/Timothy H Meeks/
Supervisory Patent Examiner, Art Unit 1792